Muon Design Note #4

TITLE: Electrical Bus Inspection Procedure

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SUBJECT: Procedures to insure that the electrical bus was installed correctly.

Figure 1 below gives an electrical schematic of the bus for the Chicago Cyclotron Magnet (CCM).

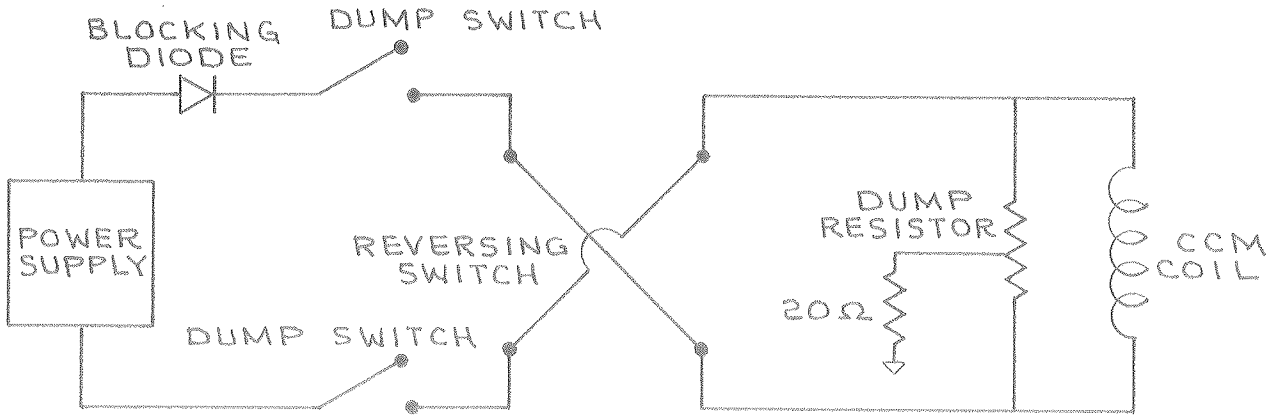

Fig. 1. Electrical schematic for CCM

The current in the electrical system is to be carried by two 535 MCM electrical cables. Each individual cable is capable of carrying 455 amps DC and 600 volts. The maximum current for the magnet is 900 amps DC and the maximum discharge voltage is 90 volts.

The flags used to connect the dump resistor modules together, magnet flags and the connection flags for the dump resistor unit will have a minimum cross section area of 2.6 in^2. This is greater than the cross sectional area of the twin electrical cable which is 0.42 in^2.

The magnet flags, dump resistor flags will be silver plated to reduce resistance, each cable will be connected with two bolts and will have a minimum surface contact area of 1 in^2. All this is done to insure a good mechanical and electrical connection. If any of these connections should come loose, an arc will occur. The other conections between the dump resistor, reversing switch, dump switch, and power supply will have two bolts per cable and have a minimum surface contact area of 1 in^2.

Inspection Procedure

1. Insure that the twin cables connecting the following components is 535 MCM, 90°C cable; power supply, dump switch, reversing switch, dump resistor and magnet.

2. Check to see that all the connectors that have been crimped onto the MCM cable are adequate.

3. Each 535 MCM cable is to be connected tightly with two bolts, two nuts and two flat washers. The flat washers are to go between the nut and crimp connector and the bolt head and crimp connection.

4. Check for any physical shorts.

5. Check the wiring to see if it is per Fig. 1.

6. Check to see that the wire is being used for the center tap is 600 V-12 Awg wire.

7. Check resistance of 20 Ω resistor.

8. Open the dump switch and check to see that the resistance of the circuit is close to 80 ohms. The magnet coil resistance is approximately 75 ohms.

9. Check to see that the reversing switch moves.

10. Check to see that the dump switch operates with a signal from the inner lock system.

11. Check to see that the dump resistor is wired properly.

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